NOAA's needs for dispersion models

The NOAA mission is dominated by the need to provide environmental forecasts — to protect people, property, and the environment. A subset of this relates to plume dispersion.

NOAA has a mission-oriented requirement to provide the forecasts needed by emergency managers, e.g. to guide response activities and evacuations.

Hence the focus is on where people, property, and the environment are susceptible.

We need . . . . .

- A credible urban area forecasting system, in which surface-modified descriptions of dispersion are embedded.
- A coastal area and complex terrain plume forecasting capability.
- An organized system to inject descriptions of stochastic behavior into deterministic models.
- An expert system, that takes understanding as far as possible but retains a fundamental foundation of input from skilled observers. We see plume forecasts as guidance to managers, not as absolute predictions of reality.
- A program to assess the skill of the predictive schemes.

Two considerations are basic . . . . .

- In the worst case, the need is to protect life. In this case, a bad forecast could be worse than no forecast (since it could concentrate people in areas where the risk is actually greatest).
- In practice, an accurate forecast of concentrations at a specific time and place is likely to be unattainable. It seems better to focus attention instead on what emergency managers actually want — depictions of areas where the risk is greatest. To this end, a probabilistic forecast appears a more attainable goal. In this case, a completely new approach to the model evaluation problem will be needed. (The AMS-sanctified procedures call for comparisons of predicted concentrations versus measured. What would now be needed is a test of the prediction of probabilities of exceeding specified levels.)

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